

Development of a Self-Efficacy Scale for Supporting Early Literacy Skills

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Abstract

The aim of this study is to develop a measurement tool for self-efficacy perception to support early literacy skills. In the study, an item pool of 60 items was created by considering the relevant literature. The form was presented to the field experts who had studies in the relevant fields, and 5 items in the item pool of the scale were removed from the scale in line with the expert opinions. After taking expert opinions, the 60-item form was filled in by 493 pre-school teacher candidates at Sivas Cumhuriyet and Tokat Gaziosmanpaşa Universities. Before the analysis, extreme, deviating, missing or erroneous values were corrected. As a result of the corrections made, validity and reliability studies were carried out in line with the responses from 467 students. As a result of the exploratory factor analysis, it was determined that the scale consists of 40 items and 6 sub-dimensions. The form consisting of 40 items and 6 sub-dimensions explains 65.10% of the total variance. These dimensions are named as Visual Reading, Listening / Monitoring, Phonological Awareness, Print Awareness, Basic Writing Skills and Assessment of Progress in accordance with the literature. As a result of the confirmatory factor analysis, it was determined that the fit indices of the 6-factor structure were within acceptable limits. The Cronbach alpha reliability coefficient for the whole scale is 0.96, and the Cronbach alpha reliability coefficient for the sub-dimensions is between 0.84 and 0.91. As a result of these findings, it was revealed that the scale measures the self-efficacy perception to support early literacy skills in a valid and reliable way.

Keywords : Early Literacy, Self-Efficacy, Scale Development

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INTRODUCTION

Literacy skills form the basis of lifelong learning skills as a critical process in human development process. Literacy skills also play an important role in the formation of thought in the process of making and sharing meaning. In this period, which can be defined as the information and communication age, the critical role of literacy skills in the process of making meaning and sharing continues, although the means of acquiring and sharing information are transforming from paper / pencil form to screen / light form. As such, the support of children's literacy skills from early childhood should be considered in terms of making them successful individuals in terms of creating and sharing meaning in the future.

When the literacy development process of the individual is considered as a whole, learning to read and write formally, in other words, the ability to produce and share ideas through the alphabetical system plays a critical role to maximize the literacy skill of the individual. Especially in academic terms, the fact that the individual performs all learning processes with literacy skills makes the importance of this process even more clear. For this reason, learning to read and write includes a process that can be called a turning point in an individual's life. In general, learning to read and write is considered as a task to be carried out in the first grade of primary school. Studies on children's learning processes of reading and writing show that children have knowledge and skills in many areas in terms of reading and writing skills until they start primary school (Armbruster, Lehr, & Osborn, 2006; Barratt-Pugh & Rohl, 2000; Langer & Sheila Flihan, 2000; Teale and Sulzby, 1988). These skills, stated as early literacy skills, are important predictors of reading and writing success (Strickland 1998). In the relevant literature, researchers classify these skills in various ways. Phonological awareness, print awareness and verbal language skills, listening comprehension, visual discrimination, auditory discrimination, rapid automatized naming, memory, attention, etc. It is stated that many structures have an important role in the process of learning reading and writing skills (Akyol, 2007; Bayraktar & Temel, 2014; Gökkuş, 2016; Karaman, 2016; Kargın, Ergül, Büyüköztürk, & Güldenöglü, 2015; Wagner, Torgesen, and Rashotte; 2013;). When these classifications are examined, it is also possible to classify early literacy skills under the headings of visual reading, listening / watching, phonological awareness, print awareness and basic writing skills (Delican, 2018). It can be stated that these structures, which started to develop from early childhood, have a significant effect on reading and writing success. However, it is also among the results of many studies (Aram & Biron, 2004; Erdoğan, 2009; Lonigan, Allan, & Lerner 2011; Şimşek, 2011) that children started primary school with various difficulties in terms of early literacy skills.

In addition to early literacy skills, pre-school education, the educational background of the family, mother tongue, socio-economic level, home literacy environment and school starting age, etc. It is known that many factors have an effect (Alisinanoğlu & Şimşek, 2012; Neumann & Neumann, 2014; Lonigan, Allan, & Lerner, 2011; Oktay, 2007). Along with these factors, families, preschool teachers and classroom teachers also have roles and responsibilities on early literacy and literacy skills in early childhood. The knowledge and desire of parents and teachers to support early literacy skills can also ensure that children have qualified experiences in terms of literacy development. This is the reason why families 'and teachers' self-efficacy perceptions to support early literacy skills are an important variable in forming this process. Bandura (1977) states that the concept of self-efficacy as the belief in one's own abilities in planning and realizing the forms of action that an individual needs to manage their future situations (Arseven, 2016). In this respect, the roles of families and teachers in the process of supporting early literacy skills are also in relation to their self-efficacy perceptions.

It is seen that various researches have been made When examining the literature on self-efficacy perception in Turkey to determine the children's literacy development and the promotion of literacy teaching. The study conducted by Delican (2016), a tool was developed to evaluate teachers' self-efficacy perceptions for teaching first reading and writing. The study conducted by Yıldırım, Ateş, and Çetinkaya (2016), a scale adaptation study was conducted to determine teachers' self-efficacy perceptions for teaching reading and writing. Early Literacy Home Environment Scale was created in the study conducted by Karahmetoğlu (2015). Baştuğ (2020) established the Early Literacy

Environment Assessment Scale of Preschool Classes. Altun and Tantekin Erden (2016) evaluated pre-school pre-service teachers' knowledge of the concept of early literacy and determined that they did not have sufficient knowledge. However, it is seen that various assessment and evaluation tools have been developed for evaluating children's early literacy skills (Delican, 2018; Karaman, 2016; Kargin, Ergül, Büyüköztürk, & Güldenöğlü, 2015). Considering these studies in the relevant literature, it can be stated that various studies have been conducted to develop and support children's early literacy and literacy skills. It was observed that various factors that are thought to have an impact on the development of early literacy skills were taken into account in these studies. On the other hand, it can be stated that a measurement tool for determining the perception of self-efficacy towards supporting early literacy skills was not encountered in the relevant literature. It is thought that a tool created to evaluate the perception of self-efficacy towards supporting early literacy skills will contribute to the determination of the educational needs of families, preschool teachers and classroom teachers. In this sense, the main purpose of this study is to develop a valid and reliable measurement tool to reveal the perception of self-efficacy to support early literacy skills.

Procedure

This research, which aims to develop a tool to determine the perception of self-efficacy to support early literacy skills, was planned in a survey model in the nature of developing a scale. The stages at which the self-efficacy perception scale development work to support early literacy skills took place and the characteristics of the study group are presented below.

Study Group

The study group of the study included 2nd, 3rd and 4th grade students enrolled in the Preschool Education undergraduate program at Sivas Cumhuriyet and Tokat Gaziosmanpaşa Universities. There are 467 pre-school teacher undergraduate students in the study group.

Development of Scale

At the first stage of scale development, the literature was examined and what could be the indicators to support early literacy development was investigated. In this context, studies in this field at home and abroad were examined and expressions that could be used in the scale were determined. Categories, indicators, definitions and items related to this definition regarding the support of early literacy skills are presented in Table 1.

Table 1 Indicators and Items Written on the Indicators for Supporting Early Literacy Skills

Dimension	Definations	Indicators	References
Visual Reading	Supporting children's skills of recognizing, understanding and interpreting images between the ages of 0-8.	(m1-m11) To be able to notice the pictures that are the same / different, To be able to identify the related pictures, To find the parts that complement the picture, To match the colors, To determine the visual equivalent of the word / sentence, To be able to answer questions using visuals, To sort the visuals in order of occurrence	
Listening/ Monitoring	Supporting the skills of children between the ages of 0-8 to comprehend what they hear, to understand what they listen, and to interpret what they listen.	(m12-m20) Following the instructions, Expressing the synonymous / antonymous meaning of the concepts, Comprehending what they listened to, Drawing conclusions from what they listened, Being able to remember what you listened, Understanding what you listened to, Being able to apply what you listened to	

Phonological Awareness	Supporting word, syllable, first sound - last phoneme and phonemic awareness of children aged 0-8 and counting, recognition, combining, separating, deleting and changing skills for these sub-skills.	(m21-m31) Recognizing Rhyme Sequences, Matching Rhyme Words, Matching Words Starting with the Same Sound, Making Words Appropriate to the Sound, Deleting the First Sound of the Word, Deleting the Last Sound of the Word, Changing the First Sound of the Word, Changing the Last Sound of the Word, Word Merge, Syllable Combination, Sound Combining, Word Separation, Syllable Separation, Sound Separation
Print Awareness	Supporting the knowledge of children between the ages of 0-8 on writing editing, writing functions and book arrangements.	(m32-m41) Understanding the aim of the creation of the Books, the way of using the Books, the organization of the Books, Understanding how the writing is organized, Understanding how words and letters can be named, Understanding the concepts of sentences, words and letters, Realizing that letters have meaning, Understanding that words and letters are different from other text types such as numbers or scribbles.
Basic Writing Skills	Basic writing skill is the ability to perform the physical elements of writing based on small muscle skills, to draw knitting and shapes, and to write letters.	(m42-m50) Combining Lines, Copying Lines, Weaving and copying shapes, Drawing letters, Sitting position, Holding paper, Wrist posture, Holding a pencil, Distance between paper and eye, Writing from left to right, Writing from top to bottom
Evaluation of Progress	It is the evaluation of the development in Early Literacy skills and the reflection of the results in the programs.	(m51-m60) To be able to create appropriate measurement tools, to use evaluation tools, To be able to organize studies according to the results of the evaluation, to identify students who have difficulties, to organize studies to eliminate difficulties, to keep a record of development, to implement individual development programs

Akyol, 2007; Armbruster, Lehr ve Osborn, 2003; Baş ve Örs, 2015; Bauseman, 2008; Bayraktar ve Tenel, 2014; Beauchat, Blamey ve Walpole 2010; Bentin ve Leshem, 1993; Bostorm, 2011; Ciserio, 1993; Cooper 1997; Doğan, 2011; Ford, 2010; Garner ve Boehma, 2004; Gökkus, 2016; Güneş, 2007; Justice ve Ezell, 2001; Justice ve Pullen, 2003; Karne enui, Adams ve Lyon, 2002; Konza, 2011; Lassonde 2001; Lonigan ve Whitehurst, 1998; MEB, 2009; MEB, 2013; MEB, 2013; MEGEP, 2007; Oktay, 2010; Özbay, 2005; Ratzon, Efraim ve Bart, 2007; Schuele ve Boudreau, 2008; Sürsühal ve LeFevre, 2002; Stewart ve Lovelace, 2006; Svant, 2016; Şimşek, 2012; Torgesen ve Mathes, 1998; Turan ve Akoğlu, 2011; Vellutino ve Scanlon, 1987; Wolwin ve Coakley 2000.

A pool of 60 items in total was created, taking into account each indicator on the promotion of early literacy skills. Considering each one of the indicators to support early literacy skills, a pool of 60 items in total was created. The pool included 11 items for the Visual Reading dimension, 9 items for the Listening / Monitoring dimension, 11 items for the phonological awareness dimension, 10 items for the print awareness dimension, 9 items for the basic writing skills and 10 items for the evaluation of progress.

The 60-item trial form was evaluated by 3 experts working in the field of early literacy, 1 expert from the field of assessment and evaluation, and 2 experts from the field of literacy teaching in order to obtain expert opinions. A triple rating (suitable / corrected / subtracted) was used to obtain the opinions of the experts. In the expert evaluation form prepared, each item was evaluated under the headings of measuring self-efficacy for evaluating early literacy skills, being related to the relevant sub-dimension, comprehensibility of the expression, and appropriateness of language. In line with the expert opinions obtained, 7 items were rearranged and some items were corrected. In the last case, a 60-item form was created. Individuals' self-efficacy levels for the items in the scale were determined using the Likert-type five-point rating scale, with 1 being the lowest and 5 being the highest.

Data Collection and Analysis

The created scale form was applied to the students by the researcher. Before the application was made, the study groups were informed about the subject of the research. The form was shared with prospective teachers through the Google Forms Application. During the data collection process, 493 participants filled the form. Before starting the analysis of the data, extreme, outlier, missing or incorrect values were corrected. In this process, validity and reliability studies of the scale were conducted in line with the answers from a total of 467 participants who participated in the study.

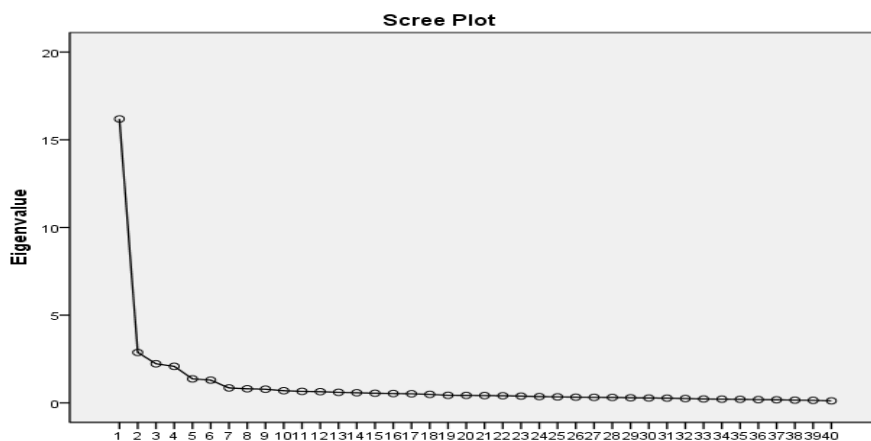
Within the scope of the research, it was first evaluated whether the data were suitable for factor analysis (Kaiser-MeyerOlkin [KMO] coefficient and BarlettSphericity Test). In order to determine the construct validity of the Self-Efficacy Scale for Supporting Early Literacy Skills, EFA was performed using principal component analysis with Oblimin rotation. Cronbach alpha coefficient was calculated for the sub-dimensions and total reliability of the scale. Item test correlations were determined to provide evidence for item validity. In addition, CFA was performed to test the accuracy of the theoretical factor structure revealed by EFA.

FINDINGS

In this study, which aims to develop a tool to determine the perception of self-efficacy to support early literacy skills, the validity and reliability studies of the scale were carried out in line with the data obtained from 467 pre-school pre-service teachers. In this context, exploratory factor analysis, confirmatory factor analysis, item total correlation analysis, Cronbach Alpha reliability coefficient and t-test analysis between 27% lower and upper groups were performed.

Exploratory Factor Analysis Results

Before the exploratory factor analysis application, the Kaiser-Meyer-Olkin (KMO) test was applied to test the suitability of the sample size to factoring. As a result of the analysis, it was determined that the KMO value was 0.95. This finding shows that the sample size is sufficient for factor analysis (Field, 2009; Hutcheson & Sofroniou, 1999). In addition, Bartlett Sphericity test was applied to determine whether the data came from multivariate normal distribution. When Bartlett test results were examined, it was seen that the obtained chi-square value was significant ($\chi^2 = 12946.465$; $p = 0.00$). It is desirable for the KMO value to approach 1 in the suitability of the data for factor analysis (Tavşancıl, 2010) and Bartlett test to be significant (Büyüköztürk, 2010; Kalaycı, 2010). Accordingly, it was accepted that the data came from multivariate normal distribution. It was concluded that the data obtained according to KMO and Bartlett Sphericity test values were suitable for factor analysis study. Tabachnick and Fidell (2007) state that components with an eigenvalue of one and above have a significant contribution to variance. As a result of the analysis, it was seen that there were 10 components with an eigenvalue above 1 for the 52 items that were taken as the basis of the analysis. It was observed that the items that do not load any factors and when the overlapping items are removed, the items can be assembled under 6 components. Considering the contribution of the 6 components identified to the total variance explained and the slope-puddle plot, it was seen that 6 components made a significant contribution to the variance. Breaking points and eigenvalues in the slope-plot graph reveal that the scale has a six-component structure. This result is considered significant in terms of being compatible with the expected number of components in the theoretical structure predicted during the development process of the scale.



Model 1 Scree Plot Chart

Scree Plot chart is presented in Model 1.

In the exploratory factor analysis conducted to reveal the factor design of the Self-Efficacy Scale for Supporting Early Literacy Skills, factor load values range from 0.41 to 0.92. In the analysis process, items with factor load values below 0.30 acceptance value, overlapping and incompatible with the factor were excluded from the analysis. In addition, in order to make the scale convenient for the number of items / usefulness, the number of items was reduced by taking into account the total variance explained and the common factor variance of the items. These items were excluded from the analysis and the exploratory factor analysis was performed again. In Table 2, factor load values and common factor variance are presented after removing the items that are overlapping, below the acceptance value and eliminated in terms of usefulness.

Table 2 Self-Efficacy Perception Scale for Supporting Early Literacy Skills Factor Load Values and Common Factor Variance

Size	Item	Item Number	Factor						Common Factor Variance
			1	2	3	4	5	6	
Visual Reading	1	M1	0.60						0.43
	3	M2	0.79						0.68
	4	M3	0.79						0.60
	6	M4	0.52						0.55
	7	M5	0.68						0.61
	8	M6	0.56						0.53
Listening/Monitoring	9	M7		0.72					0.53
	18	M8		0.73					0.63
	19	M9		0.72					0.69
	20	M10		0.73					0.75
	21	M11		0.80					0.71
	22	M12		0.62					0.72
Phonological Awareness	23	M13			0.59				0.61
	27	M14			0.57				0.51
	28	M15			0.91				0.60
	29	M16			0.86				0.80
	30	M17			0.81				0.78
	31	M18			0.47				0.78
	32	M19			0.55				0.62
Print Awareness	33	M20				0.61			0.61
	36	M21				0.54			0.53
	37	M22				0.65			0.57
	38	M23				0.68			0.66
	39	M24				0.72			0.69
	40	M25				0.69			0.69
	41	M26				0.63			0.69
42	M27				0.51			0.60	
Basic Writing Skills	43	M28					0.56		0.54
	49	M29					0.80		0.57
	50	M30					0.85		0.74
	51	M31					0.81		0.75
	52	M32					0.65		0.72
Evaluation of Progress	53	M33						0.76	0.55
	54	m34						0.82	0.65
	55	M35						0.85	0.73
	56	M36						0.77	0.75
	57	M37						0.83	0.64
	58	M38						0.70	0.73
	59	M39						0.81	0.63
	60	M40						0.76	0.68
Eigenvalue			16.18	2.87	2.25	2.10	1.37	1.30	
Variance Explained			40.46	7.18	5.57	5.21	3.42	3.21	
T. Variance Explained			65.10						

As seen in Table 2, out of 7 items with the first dimension factor load ranging from 0.55 to 0.80; Second dimension factor load was composed of 6 items with varying between 0.59 and 0.73;

Third dimension factor loading consists of 7 items varying between 0.47 and 0.92; The fourth dimension included 8 items with a factor load between 0.51 and 0.73; The fifth dimension included 5 items with a factor load between 0.56 and 0.85; The sixth dimension consists of 7 items with a factor load between 0.71 and 0.86. It has been observed that all factors explain 65.10% of the total variance. The first factor explains 40.49% of the total variance and was named as "visual reading" considering the literature. The second factor explains 7.18% of the total variance and was named as "listening / monitoring". The third factor explains 5.57% of the total variance and was named as "phonological awareness". The fourth factor explains 5.21% of the total variance and was named "print awareness". The fifth factor explains 3.41% of the total variance and was named as "basic writing skills". Sixth factor explains 3.24% of the total variance and is named as "evaluation of progress".

The relationship between the sub-dimensions of the scale was questioned on the same study group. Correlation coefficients between sub-dimensions are presented in Table 3.

Table 3 Correlation Coefficients Between Sub-Dimensions

Dimensions	VR	L/M	PA	PrA	BWS	EP
Visual Reading	1	0.40	0.45	0.34	0.36	0.44
Listening/Monitoring		1	0.37	0.33	0.12	0.37
Phonological Awareness			1	0.44	0.39	0.46
Print Awareness				1	0.36	0.53
Basic Writing Skills					1	0.44
Evaluation of Progress						1

P<0.01

When Table 3 is examined, it is seen that the correlations between the sub-dimensions of the scale differ between 0.12 and 0.53 and have a notable difference at the 0.01 level. According to the results of the analysis, it was seen that the dimensions were in a low but significant relationship with each other.

Confirmatory Factor Analysis Results

CFA was applied to the model obtained in order to test the validity of the factor structure that emerged as a result of the exploratory factor analysis. In the examination of the model that emerged as a result of EFA, it was first evaluated whether the items were compatible with the resulting factor structure, and the significance of the t-values of each item was questioned under the determined factor structure. In this review, it was determined that 40 items within the 6-factor structure resulting from EFA are significant under the relevant factors. Secondly, the standard factor load values of each item were examined. As a result of the analysis, it was observed that the standard factor load values were 0.30 and above. Finally, the fit values of the model reached were examined. The fit values of the model achieved are presented in Table 4.

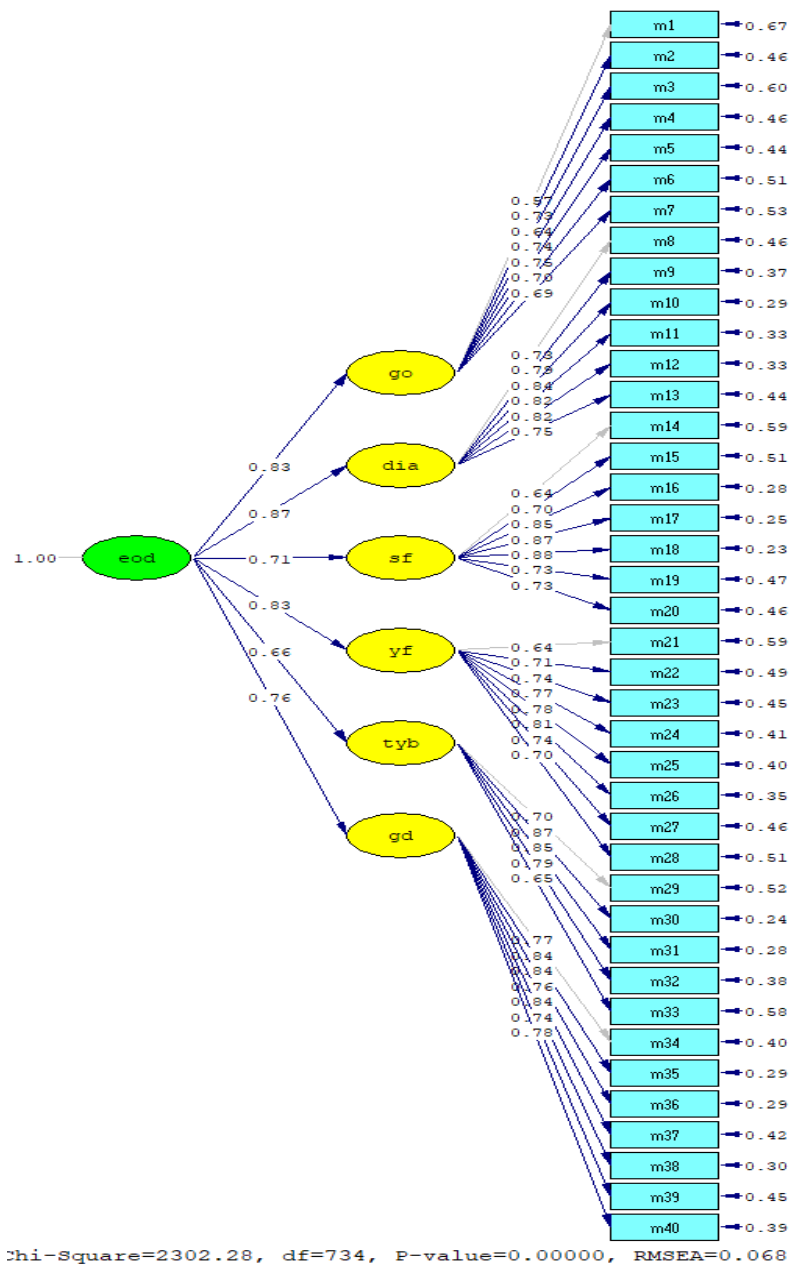
Table 4 Confirmatory Factor Analysis Adjustment Values of the Self-Efficacy Perception Scale for Assessing Early Literacy Skills

Fit Indices	Good Fit Indices	Perfect Fit Indices	CFA Results
Chi-square/sd	$3 < X^2/sd \leq 5$	$0 \leq X^2/sd \leq 3$	3.06
RMSEA	$0.05 \leq RMSEA \leq 0.08$	$0.00 \leq RMSEA \leq 0.05$	0.07
SRMR	$0.05 < SRMR \leq 0.08$	$0.00 \leq SRMR \leq 0.05$	0.06
NNFI	$0.90 \leq NNFI < 0.95$	$0.95 \leq NNFI \leq 1.00$	0.97
CFI	$0.90 \leq CFI < 0.95$	$0.95 \leq CFI \leq 1.00$	0.97

When the CFA fit indices expressed in Table 4 are examined; When the values reached are compared with acceptable ranges, it can be said that the values are within acceptable limits (Çokluk, Şekercioğlu ve Büyüköztürk, 2012; Jöreskog ve Sörbom, 1996; Seçer, 2013; Tabachnick ve Fidell, 2007).

Chi-square / sd value is 3.06 and it fits well; The RMSEA value is 0.06 and it fits well; The SRMR value is 0.06 and it fits well; The NNFI value is 0.97 and it fits perfectly; It can be said that the CFI value is 0.97 and it fits perfectly. According to the adjustment values obtained as a result of the confirmatory factor analysis, it can be stated that the model of the Self-Efficacy Scale for Supporting Early Literacy Skills, consisting of 40 items and 6 dimensions, has generally been a good fit.

Since it was determined that the fit values obtained as a result of the CFA analysis fit well, there was no need for any modification between the items. Standard factor load values for each item are presented in Figure 2.



Model 2. Self-efficacy perception scale confirmatory factor analysis for assessment of early literacy skills.

When Model 2 is examined, it is seen that the factor load values vary between 0.29 and 0.67. This finding shows that the factor loading values of the items should be 0.30 and above.

Findings Regarding Reliability and Item Analysis

First, item-total correlations were calculated in order to determine whether each item in the scale measured the property they wanted to measure and how they were sufficient in distinguishing individuals in terms of the feature they measured. Secondly, t-test was used for the significance of the difference between item scores of the upper 27% and lower 27% groups according to the total score. In addition, Cronbach alpha internal consistency coefficient was examined to determine the reliability of the scale.

Item total correlations for each item in the scale and $C\alpha$ reliability coefficients for each sub-dimension are presented in Table 5.

Table 5 Item-Total Correlations and $C\alpha$ Reliability Coefficients for Each Sub-Dimension

Dimension	Cronbach Alpha	Item	X	S	Item Total Correlation	Cronbach Alpha When Item Is Removed
Visual Reading	0.84	m1	3.94	0.77	0.50	0.83
		m3	4.25	0.69	0.70	0.79
		m4	4.52	0.62	0.60	0.81
		m6	3.96	0.80	0.63	0.80
		m7	4.14	0.74	0.67	0.79
		m8	4.17	0.81	0.59	0.81
Listening/Monitoring	0.89	m9	3.99	0.79	0.55	0.89
		m18	4.20	0.75	0.69	0.87
		m19	4.05	0.78	0.73	0.87
		m20	4.04	0.77	0.79	0.86
		m21	4.01	0.81	0.75	0.86
		m22	4.02	0.79	0.75	0.86
Phonological Awareness	0.89	m23	4.12	0.78	0.48	0.90
		m27	3.92	0.85	0.63	0.88
		m28	3.85	0.83	0.71	0.87
		m29	3.53	0.92	0.77	0.86
		m30	3.49	0.96	0.79	0.86
		m31	3.49	0.94	0.79	0.86
Print Awareness	0.89	m32	3.79	0.85	0.65	0.88
		m33	3.70	0.87	0.56	0.89
		m36	4.20	0.81	0.61	0.88
		m37	4.11	0.78	0.67	0.88
		m38	4.32	0.74	0.69	0.88
		m39	4.35	0.73	0.71	0.87
Basic Writing Skills	0.82	m40	4.02	0.83	0.73	0.87
		m41	3.99	0.85	0.75	0.87
		m42	3.97	0.84	0.66	0.88
		m43	3.79	0.98	0.41	0.86
		m49	4.23	0.77	0.65	0.77
		m50	4.43	0.71	0.73	0.75
Evaluation of Progress	0.91	m51	4.44	0.69	0.71	0.76
		m52	4.46	0.71	0.65	0.77
		m53	4.58	0.68	0.38	0.92
		m54	3.86	0.93	0.71	0.89
		m55	3.78	0.90	0.79	0.89
		m56	3.88	0.86	0.79	0.89
		m57	4.05	0.82	0.71	0.89
		m58	3.85	0.91	0.80	0.89
		m59	4.02	0.88	0.71	0.89
		m60	3.73	0.97	0.75	0.89

0.95 for Cr α reliability of the whole scale, Cr α 0.84 for Visual Reading, Cr α 0.89 for Listening / Monitoring, Cr α 0.89 for Phonological Awareness, Cr α 0.89 for Print Awareness, Cr α 0.82 for Basic Writing Skills and Cr α 0.91 for Evaluation of Progress was found. All these findings show that the scale has a satisfactory level of reliability.

With factor analysis, 40 item analyzes were made in 6 dimensions, and individuals who did not serve for the purpose of questioning and had the feature to be measured and those who did not know were questioned. To determine that measurement items do not serve the purpose of measuring, item analysis results summarized in Table 4 were examined. According to this; When the item-total test correlations to the Visual Reading dimension are examined, the values vary between $r = 0.50$ and $r = 0.70$. When the item-total test correlations in the listening / monitoring dimension are examined, the values vary between $r = 0.55$ and $r = 0.79$. When the item-total test correlations in the Phonological Awareness dimension are examined, the values vary between $r = 0.48$ and $r = 0.79$. When the item-total test correlations in the Print Awareness factor are examined, the values vary between $r = 0.56$ and $r = 0.75$. When factor-total test correlations in Basic Writing Skills are examined, the values vary between $r = 0.41$ and $r = 0.71$. When the item-total test correlations are examined in the evaluation factor of progress, the values vary between $r = 0.38$ and $r = 0.80$. When the item total test correlations are examined, it is above $r = 0.30$ for an item. This situation serves the purpose of being measured.

In addition, whether each item distinguishes individuals with the desired feature to be measured and those who do not, the upper 27% (assumed to have a high level of the measured feature) and the lower 27% (assumed to have low or not the measured feature) determined according to the total scale scores. The differences between the mean scores were examined using the unrelated t-test. These data are presented in Table 6.

Table 6 Lower and Upper Groups t-Test Results of 27% of the Self-Efficacy Perception Scale for Supporting Early Literacy Skills

M. No	Lower %27 (n=127)		Upper %27(n=127)		t
	\bar{X}	S	\bar{X}	S	
m1	3.47	0.70	4.42	0.77	10.23
m3	3.71	0.70	4.76	0.44	14.30
m4	4.15	0.70	4.91	0.32	11.04
m6	3.25	0.71	4.58	0.61	15.99
m7	3.59	0.74	4.72	0.53	14.06
m8	3.57	0.82	4.81	0.43	15.10
m9	3.43	0.71	4.64	0.57	15.01
m18	3.59	0.63	4.78	0.49	16.76
m19	3.32	0.58	4.72	0.52	20.28
m20	3.35	0.62	4.77	0.42	21.38
m21	3.28	0.65	4.76	0.46	21.01
m22	3.32	0.69	4.72	0.51	18.37
m23	3.42	0.66	4.83	0.39	20.79
m27	3.31	0.73	4.59	0.61	15.22
m28	3.17	0.69	4.56	0.63	16.75
m29	2.94	0.79	4.22	0.83	12.51
m30	2.84	0.83	4.24	0.79	13.75
m31	2.84	0.75	4.28	0.87	14.12
m32	3.11	0.69	4.61	0.55	19.04
m33	3.00	0.71	4.46	0.65	17.09
m36	3.57	0.86	4.78	0.43	14.18
m37	3.49	0.72	4.75	0.47	16.47
m38	3.76	0.75	4.88	0.32	15.48
m39	3.79	0.76	4.88	0.32	14.89
m40	3.39	0.72	4.74	0.54	16.92
m41	3.29	0.74	4.77	0.47	19.05
m42	3.32	0.78	4.65	0.55	15.73
m43	3.00	0.82	4.61	0.67	17.15
m49	3.65	0.73	4.83	0.39	16.16
m50	3.92	0.83	4.89	0.34	12.15
m51	3.99	0.78	4.87	0.34	11.55

m52	3.95	0.82	4.87	0.40	11.44
m53	4.15	0.86	4.94	0.23	10.12
m54	3.11	0.89	4.62	0.62	15.70
m55	2.98	0.75	4.59	0.63	18.50
m56	3.19	0.77	4.64	0.57	16.96
m57	3.41	0.82	4.72	0.48	15.58
m58	3.17	0.83	4.66	0.58	16.60
m59	3.32	0.85	4.72	0.54	15.71
m60	3.05	0.89	4.59	0.65	15.81

p<0,001

It is seen that the t values regarding the differences between item scores of 27% of the lower and upper groups of the scale ranged from 10.12 to 21.38 and all of them were significant ($p < 0.01$). The average scores of the items in the 27% subgroup ranged from 2.84 to 4.15. The average scores of the items in the upper group of 27% range from 4.22 to 4.94. Based on this finding, it can be said that all items of the scale can reveal the differences between individuals, in other words, by distinguishing between those that have a feature and those that do not.

RESULTS

In this study, which aims to develop a tool to determine the perception of self-efficacy to support early literacy skills, the validity and reliability studies of the scale were carried out in line with the data obtained from 467 pre-school pre-service teachers. In this context, exploratory factor analysis, confirmatory factor analysis, item total correlation analysis, Cronbach Alpha reliability coefficient and t-test analysis between 27% lower and upper groups were performed. The results achieved are as follows;

Firstly, Kaiser-Meyer-Olkin (KMO) and Bartlett Sphericity tests were applied to test the suitability of the tool for factoring. These tests are frequently used to examine the suitability of the sample and the data set to factorization, and the KMO value is expected to be 0.5 and above and the Bartlett Sphericity test to be significant (Büyüköztürk, 2010; Tavşancıl, 2010). Considering that the KMO value reached in the scale is 0.95, it has been determined that the sample size is suitable for factoring. In addition, the fact that Bartlett Sphericity test was found to be significant indicates that the data set is suitable for factor analysis (Büyüköztürk, 2010; Seçer, 2013; Tavşancıl, 2010).

In order to reveal the construct validity of the instrument, exploratory factor analysis was applied first. As a result of EFA, it was determined that the scale explained 65.10% of the total variance with 40 items assembled under 6 components. It was determined that there are 6 components with an eigenvalue above 1 in the structure reached after the items that are unbound and do not load any factor are removed. In the relevant literature, many researchers state that components with an eigenvalue of 1 and above have a significant contribution to variance (Seçer, 2013; Çokluk, Şekercioğlu, & Büyüköztürk, 2012). Seçer (2013) states that considering more than one technique together instead of a single technique in determining the factor and deciding the number of factors gives healthier results. When the slope plots of the 6 components reached in this direction were examined, it was observed that the fractures in the graph indicated 6 components. Factor load values in the structure reached during the EFA process vary between 0.41 and 0.92. Many researchers state that item factor loads should be above 0.40, but this value may decrease to 0.30 as the number of samples increases (Büyüköztürk, 2010; Field 2009; Tabachnick & Fidell, 2007). It can be said that the factor loads reached in the scale also have the desired properties. These results obtained in the exploratory factor analysis can be presented as evidence for the validity of the tool. This structure obtained as a result of EFA is also important in terms of compliance with the theoretical structure predicted during the creation of the tool. For this reason, the achieved factors are named as visual reading, listening / monitoring, phonological awareness, print awareness, basic writing skills and evaluation of progress in line with the relevant literature. Confirmatory factor analysis (CFA) is among the frequently preferred techniques in testing the factor structure obtained as a result of EFA (Çokluk, Şekercioğlu, & Büyüköztürk, 2012; Harrington, 2009; Tabachnick & Fidell, 2007). In this study, confirmatory factor analysis was applied to test the factor structure obtained as a result of the exploratory factor analysis.

In this process, firstly, the t values of each item were examined and it was found that they were significant under the related factors. It was observed that the standard factor load values were above 0.30. In the relevant literature, it is pointed out that the t values of the items under the related factors should be significant and the standard factor load values should be 0.30 and above (Jöreskog & Sörbom, 1996, Seçer, 2013). However, in the relevant literature, researchers also state that the fit values of the model reached should be questioned (Çokluk, Şekercioğlu, & Büyüköztürk, 2012; Seçer, 2013). In this study, chi-square / df, RMSEA, SRMR, NNFI and CFI values were examined and it was determined that the values obtained indicate good fit of the model. As a result of the values obtained in the exploratory and confirmatory factor analysis, it was concluded that there were desired features in the factor structure of the scale.

Within the scope of the reliability and item analysis studies of the Self-Efficacy Scale for Supporting Early Literacy Skills, item-total correlations were determined in order to indicate whether each item measured the property it wanted to measure and how sufficient they were in distinguishing individuals in terms of the feature they measured. As a result of this analysis, it was determined that the item total correlations were 0.30 and above. In the relevant literature, many researchers state that values of 0.30 and above can be presented as an evidence for the validity of scale items (Çokluk, Şekercioğlu, & Büyüköztürk, 2012; Seçer, 2013). Accordingly, it was concluded that the items in the scale serve the purpose of measurement. The Cronbach Alpha reliability coefficient obtained as a result of the reliability analysis varies between 0.82 and 0.91 for the factors. The Cronbach Alpha reliability coefficient for the whole scale is 0.95. In the relevant literature, researchers state that the Cronbach Alpha reliability coefficient should be 0.70 and above (Büyüköztürk, 2010; Seçer, 2013; Tavşancıl, 2010). When compared with the reliability coefficients identified during the analysis process, it can be said that the reliability of the scale is high. In addition, it was examined whether the items of the scale differentiated individuals with the desired feature from those who did not. In the relevant literature, it is seen that questioning the significance of the difference between the average scores of the items between the lower and upper 27% groups is a frequently used technique to reveal this situation (Büyüköztürk, 2010; Field 2009; Tavşancıl, 2010). As a result of the analysis, it was determined that there is a remarkable difference for each item between the lower and upper 27% groups. This result supports that the items in the scale are successful in distinguishing between individuals who have the desired characteristics and those who do not. In line with these results, it can be said that the self-efficacy perception scale for supporting early literacy skills makes valid and reliable measurements.

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APPENDIX – 1 Scale

Self-Efficacy Perception Scale for Supporting Early Literacy Skills			Mark your level of self-sufficiency as 1 low and 5 high.				
			1	2	3	4	5
Visual Reading	1	I can organize activities to help children distinguish the differences between pictures.	1	2	3	4	5
	2	I can prepare activities for children to find the missing piece in a picture.	1	2	3	4	5
	3	I can organize activities so that the children can match the colors.	1	2	3	4	5
	4	I can prepare activities that will enable children to make sense of pictures and symbols.	1	2	3	4	5
	5	I can prepare activities for children where they can find visual equivalents of the expressions.	1	2	3	4	5
	6	I can prepare activities where children can tell stories based on visuals.	1	2	3	4	5
	7	I can organize activities to support children's visual discrimination skills.	1	2	3	4	5
Listening/Monitoring	8	I can organize exercises for the children to add new words to their vocabulary.	1	2	3	4	5
	9	I can use strategies to improve children's listening skills.	1	2	3	4	5
	10	I can organize activities to improve children's listening comprehension skills.	1	2	3	4	5
	11	I can organize activities to improve the ability of children to remember what they listen.	1	2	3	4	5
	12	I can organize activities so that children can draw conclusions from what they listen to.	1	2	3	4	5
	13	I can organize studies so that children can distinguish sounds.	1	2	3	4	5
Phonological Awareness	14	I can organize exercises so that children can match words that start with the same sound.	1	2	3	4	5
	15	I can organize activities so that children can produce words related to a specified sound.	1	2	3	4	5
	16	I can make the children realize that new words can be produced when the first sound of some words is erased.	1	2	3	4	5
	17	I can make the children realize that new words can be produced when the last sound of some words is erased.	1	2	3	4	5
	18	I can make children realize that new words can be produced when sounds change places.	1	2	3	4	5
	19	I can grasp the children that sounds come together to form words.	1	2	3	4	5
	20	I can grasp the children that words can be divided into sounds.	1	2	3	4	5
Print Awareness	21	I can make the children notice the book organization.	1	2	3	4	5
	22	I can make the kids realize that words mean	1	2	3	4	5
	23	I can grasp the children that writing progresses from left to right.	1	2	3	4	5
	24	I can make the kids notice that the writing is running from top to bottom.	1	2	3	4	5
	25	I can make kids realize that letters are symbols that represent sounds.	1	2	3	4	5
	26	I can make children realize that letters have different meanings than scribbles and numbers.	1	2	3	4	5
	27	I can make the children understand the spaces between words.	1	2	3	4	5
	28	I can make children realize that punctuation marks have meaning.	1	2	3	4	5
Basic Writing Skills	29	I can make sure the kids can set the correct distance between the paper and the eye.	1	2	3	4	5
	30	I can give children the correct way of holding a pencil.	1	2	3	4	5
	31	I can give children the right way to hold paper.	1	2	3	4	5
	32	I can give the children the proper sitting position in the queue.	1	2	3	4	5
	33	I can organize painting / drawing activities to support children's motor development.	1	2	3	4	5
	34	I can use various assessment and evaluation methods to assess early literacy skills.	1	2	3	4	5
Evaluation of Progress	35	I can use tools that can evaluate the progress in early literacy skills.	1	2	3	4	5
	36	After evaluating early literacy skills, I can organize studies according to the results.	1	2	3	4	5
	37	I can identify students with early literacy skills difficulties.	1	2	3	4	5
	38	I can organize studies to overcome the difficulties in early literacy skills.	1	2	3	4	5
	39	I can keep track of children's early literacy development.	1	2	3	4	5
	40	I can implement individual development programs suitable for the early literacy development of children.	1	2	3	4	5